

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Hidenori USUDA

Application No.: 10/623,662

Filed: July 22, 2003

Docket No.: 116646

For: DRIVING DEVICE FOR LIQUID DROP EJECTING HEAD, DEVICE FOR FORMING MEMBRANE, METHOD FOR DRIVING LIQUID DROP EJECTING HEAD, METHOD FOR FORMING MEMBRANE, ELECTRONIC APPARATUS, AND METHOD FOR MANUFACTURING DEVICE

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

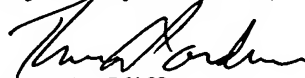
Sir:

Pursuant to 37 CFR §1.56, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO-1449. Unless otherwise indicated herein, one copy of each reference is attached. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

- ☒ 1. This Information Disclosure Statement is being filed (a) within three months of the U.S. filing date of this non-CPA application, OR (b) before the mailing date of a first Office Action on the merits in the present application. No certification or fee is required.
- ☒ 2. The references were cited in a counterpart foreign application. An English language version of the foreign office action is attached for the Examiner's information.
- ☒ 3. English-language Abstracts of the non-English language references 1-6 are attached hereto.

- ☒ 4. A computer-generated English translation of the following Japanese Patent Publication has been obtained from the website of the Japanese Patent Office ([<http://www.jpo.go.jp>]), and is attached, but has not been reviewed for accuracy. See References 1-6.

Respectfully submitted,



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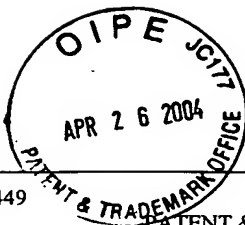
Date: April 26, 2004

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**DEPOSIT ACCOUNT USE  
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Sheet 1 of 1

Form PTO-1449 (REV. 8-83)		US Dept. of Commerce PATENT & TRADEMARK OFFICE		ATTY DOCKET NO. 116646		APPLICATION NO. 10/623,662	
INFORMATION DISCLOSURE STATEMENT  (Use several sheets if necessary)				APPLICANT(S) Hidenori USUDA			
				FILING DATE July 22, 2003		GROUP	
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	
FOREIGN PATENT DOCUMENTS							
		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	
	1.	JP A 2002-55222 w/abstract & transl.	2/20/2002	JAPAN			
	2.	JP A 2000-193922 w/abstract & transl.	7/14/2000	JAPAN			
	3.	JP A 11-20165 w/abstract & transl.	1/26/1999	JAPAN			
	4.	JP A 10-226066 w/abstract & transl.	8/25/1998	JAPAN			
	5.	JP A 2001-80072 w/abstract & transl.	3/27/2001	JAPAN			
	6.	JP A 10-329313 w/abstract & transl.	12/15/1998	JAPAN			
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)							
EXAMINER					DATE CONSIDERED		
Examiner: Initial if citation considered, whether or not citation is in conformance with M.P.E.P. 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							

Date: April 26, 2004

## NOTICE OF REASONS FOR REJECTION

**Application Number:** 2003-072335  
**Drafting Date:** 2004/03/19 (year/month/day)  
**Mailing Date:** 2004/03/30 (year/month/day)  
**Attorney:** Masatake SHIGA et al.  
**Applied Provision:** Article 29, Paragraph 2,  
Article 36

**This application is rejected for the reasons laid forth below. If the applicant wishes to comment thereon, the applicant is invited to submit a response within 60 days from the mailing date of this notice.**

### REASON

1. The invention(s) according to the below-listed claim(s) of the present application could have been easily made prior to filing date by a person with average knowledge in the field to which the invention(s) belongs based on the invention(s) disclosed in the below-listed publication(s), distributed in Japan or abroad prior to the filing date of this application, and it is therefore deemed to be unpatentable in compliance with the provisions of Japanese Patent Law, Article 29, Paragraph 2.

NOTE (See List of Citations for Detail of the Citations)

·Claim 1

·Citations etc.: Citation 1

·Remarks:

In a publication in the Citation 1, a driving device for an ink-jet recording head for ejecting an ink droplet from a nozzle aperture is disclosed by activating a piezo-element which is disposed so as to correspond to each of a plurality of nozzle apertures such that a driving waveform is formed by a piezo-element driving circuit which is formed by a memory which receives several data signals which indicate a through-rate of a driving signal which corresponds to a variance of voltage per a unit period of time and address signal from a controlling circuit so as to store therein, a first latch which reads out a data signal which indicates a predetermined through-rate according to the address from the memory so as to synchronize a clock signal so as to store therein, a second latch which adds and maintains an output of the first latch so as to synchronize the clock signal, an

adder which adds the output from the first latch and the output of the second latch, a D/A converter which converts the output of the second latch into an analogue datum, a voltage amplifying section which amplifies the converted analogue signal so as to have a voltage amplitude for driving the piezo-element, and an electricity amplifying section which supplies the electricity so as to correspond to the amplified voltage signal; thus, it is possible to control a waveform of the driving signal desirably only by outputting the address signal and the clock signal from the controlling circuit.

The nozzle aperture, a piezo-element, a data signal which indicates a through-rate of the driving signal, a memory, and a piezo-element driving circuit in the invention which is disclosed in the publication in the Citation 1 correspond to an ejecting section, a driving section, an information which relates to an inclination of a linear waveform, a memory, and a controlling section in the invention according to a Claim 1 of the present patent application respectively.

Therefore, an entire technical feature of the invention according to the Claim 1 of the present patent application is disclosed in the publication in the Citation 1.

·Claim 2

·Citations etc.: Citation 1

·Remarks:

The reason for the rejection is the same as that for the Claim 1.

Here, the nozzle aperture, a piezo-element, a data signal which indicates a through-rate of the driving signal, a controlling circuit, and a piezo-element driving circuit in the invention which is disclosed in the publication in the Citation 1 correspond to an ejecting section, a driving section, an information which relates to an inclination of a linear waveform, an outputting section, and a controlling section in the invention according to a Claim 2 of the present patent application respectively.

·Claim 3

·Citations etc.: Citations 1 and 2

·Remarks:

In the publication in the Citation 1, it is disclosed that it is possible to generate the driving signal waveform desirably by selecting a data signal which indicates a through-rate of the driving signal among the address signals.

In the publication in the Citation 2, an ink-jet recording device for recording an image by flying an ink droplet from a predetermined container by driving a voltage

element by applying a voltage according to a predetermined datum is disclosed such that the voltage is set to vary smoothly time-wise according to the datum.

The inventions which are disclosed in the Citations 1 and 2 belong to a common technical field in that both are ink-jet recording devices in which a desirable driving waveform is generated by varying the driving voltage which is applied to a piezo-element. Thus, it is understood that an ordinary skilled person in the art can easily realize a feature in the invention according to a Claim 3 of the present patent that "the linear waveform is formed by a linear waveform of which voltage is reduced nearer to an end section of the driving waveform" according to the invention which is disclosed in the publications in the Citations 1 and 2.

·Claim 4

·Citations etc.: Citations 1 and 2

·Remarks:

In a publication of the Citation 2, a waveform is disclosed which includes main pulse voltage and a sub-pulse voltage which is applied to a piezo-element so as to restrict an instability of the ink in an ink channel which is caused by applying the main pulse voltage. The waveform which is formed by such a sub-pulse voltage corresponds to a micromotion waveform in the invention according to the Claim 4 of the present patent application.

·Claims 5 to 7

·Citations etc.: Citation 1, or Citations 1 and 2

·Remarks:

A film producing device which produces a color filter or an organic electroluminescence element by using an ink-jet recording method is a commonly know technique at the time the present patent application was filed (see Japanese Unexamined Patent Application, First Publication No. 2002-55222 and No. 2000-193922 if necessary). It is not particularly difficult for an ordinary skilled person in the art to use an invention which can be easily realized by a person having an ordinary skill in the art for such a film producing device taking the invention which is disclosed in the publication in the Citation 1 or in the publications in the Citations 1 and 2 into account. Therefore, it is not possible to find a substantial inventiveness.

·Claim 8

·Citations etc.: Citation 1

·Remarks:

See above reason for the Claim 1.

·Claim 9

·Citations etc.: Citation 1

·Remarks:

See above reason for the Claim 2.

·Claim 10

·Citations etc.: Citations 1 and 2

·Remarks:

See above reason for the Claim 3.

·Claim 11

·Citations etc.: Citations 1 and 2

·Remarks:

See above reason for the Claim 4.

·Claims 12 to 14

·Citations etc.: Citation 1 or Citations 1 and 2

·Remarks:

See above reason for the Claims 5 to 7.

·Claims 15 and 16

·Citations etc.: Citation 1 or Citations 1 and 2

·Remarks:

The invention which is disclosed in the Claims 15 and 16 in the present patent application is an invention which is disclosed in the publications in the Citations 1 and 2 and can be realized easily by an ordinary skilled person in the art according to a common knowledge which is pointed out as above.

### LIST OF CITATIONS

1. Japanese Unexamined Patent Application, First Publication No. Hei 11-20165  
(In particular, see a disclosure such that "it is possible to ... as follows" in line 37 in a left column in page 6 to line 34 in a left column in page 13, and FIGS. 1 to 19)
2. Japanese Unexamined Patent Application, First Publication No. Hei 10-226066

(In particular, see a disclosure for a "predetermined recording device for ..." and a disclosure such that "it is changed ... as follows" in line 11 in a right column in page 2 to line 49 in a right column in page 4, and FIGS. 1 to 15)

2. The recitation of the claims of the present application fails to satisfy the requirements of Japanese Patent Law, Article 36, Paragraph 6, Number 2 with regard to the points listed below.

#### NOTE

A) In the Claim 9 in the present patent application, it is disclosed that "the above piezo-oscillator is driven by the above driving waveform". However, such a "piezo-oscillator" is not disclosed; thus, such a disclosure is indefinite.

Therefore, the invention according to the Claims 9 to 16 are not clear.

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#### RECORD OF PRIOR ART SEARCH

Searched Technical Fields: IPC 7th Version B41J2/01, 2/045, 2/055,  
H01L41/00-41/26

Prior Art Documents: Japanese Unexamined Patent Application, First Publication No. 2001-80072, No. Hei 10-329313.

The search records for these prior art documents do not constitute reasons for rejection.